High Resolution Autostereoscopic Cockpit Display, Phase I

Completed Technology Project (2013 - 2013)

Project Introduction

The utility of stereoscopic 3D image representation in many applications is now well established. It is not just a matter of stereo being better than 2D, but of stereo being necessary to interpret representations of complex data sets, physical phenomena, engineering designs and position in space. The US Air Force has long recognized the potential for 3D displays in the cockpit but until now the limitations of 3D display technology have prevented implementation. Interest in 3D image display has recently surfaced among SPAWAR and among agencies who use helicopters and firms that make camera systems for helicopters for use in power line inspection, law enforcement, and military applications. There is also interest in the use of plane mounted cameras in collision avoidance while taxiing on runways, where 3D display may be of benefit because it can show the pilot how much room there is between the plane and obstacles. 3D displays for these applications must be of the glasses free type, but current embodiments of such displays possess extremely low resolution, produce visual artifacts, and tend to produce very narrow viewing areas. Under a recent DOE SBIR Phase II contract DTI developed a new glasses free 2D/3D switchable display that avoids the resolution loss, visual artifacts, and viewing restrictions associated with all other autostereoscopic displays, providing full HD resolution in 3D as well as in a 2D viewing mode. DTI's believes that this new technology can lead to the first practical implementation of a 3D display in the cockpit. During this Phase I program DTI will investigate the adaptation of its 2D/3D displays to cockpit displays through compact design, ruggedizing, and the development of mechanical, electronic, computer, and software interfaces to an aircraft system. This investigation will lead to a high level design and specification for a prototype display that can developed in Phase II and delivered for testing in a cockpit or simulator.

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Dimension Technologies Inc

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

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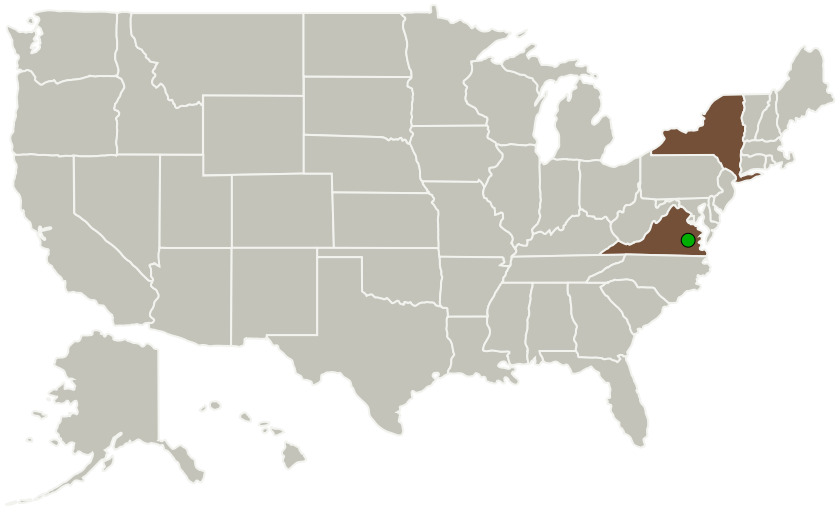
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Dimension Technologies Inc	Lead Organization	Industry	Rochester, New York
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
New York	Virginia

Project Transitions

May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140357)*

Project Management *(cont.)*

Principal Investigator:

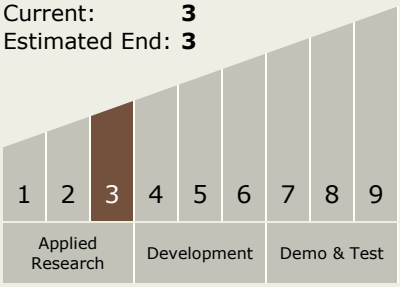
Jesse Eichenlaub

Co-Investigator:

Jesse Eichenlaub

Technology Maturity (TRL)

Start: **3**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.3 Informatics and Decision Support Systems

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Images

Project Image
High Resolution Autostereoscopic Cockpit Display
(https://techport.nasa.gov/image/135553)

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System